US008091149B2

(12) **United States Patent**
Choi

(10) **Patent No.: US 8,091,149 B2**
(45) **Date of Patent: Jan. 10, 2012**

(54) **HELMET**

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(73) Assignee: **HJC Co., Ltd.** (KR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 407 days.

(21) Appl. No.: **12/319,926**

(22) Filed: **Jan. 14, 2009**

(65) **Prior Publication Data**

US 2009/0183302 A1 Jul. 23, 2009

(30) **Foreign Application Priority Data**

Jan. 21, 2008 (KR) 10-2008-0006290

(51) **Int. Cl.**
A42B 1/08 (2006.01)

(52) **U.S. Cl.** **2/424**

(58) **Field of Classification Search** 2/422, 424, 2/15, 6.2, 6.3, 6.4, 6.5, 6.7, 6.8, 9
See application file for complete search history.

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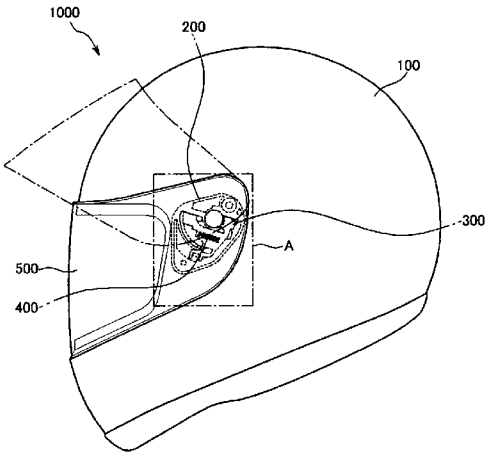
(57) **ABSTRACT**

A helmet is provided including an attachable and detachable shield plate by a simple structure. The helmet includes a helmet main body; a first plate positioned onto an outer surface of the helmet main body; a second plate structurally combined with the first plate and capable of sliding between a locking position and an unlocking position with respect to the first plate; a spring for pressurizing the second plate toward the locking position; and a shield plate capable of rotating with respect to the helmet main body and attachably and detachably installed on the first plate by the slide movement.

6 Claims, 7 Drawing Sheets



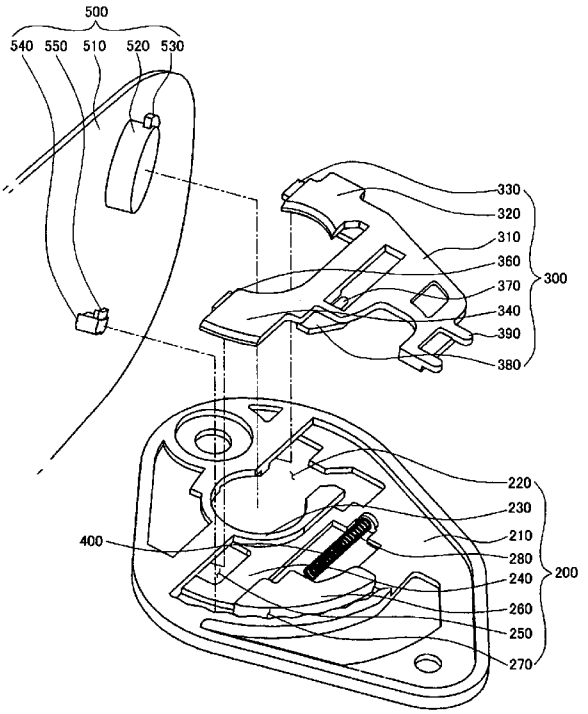


FIG. 1

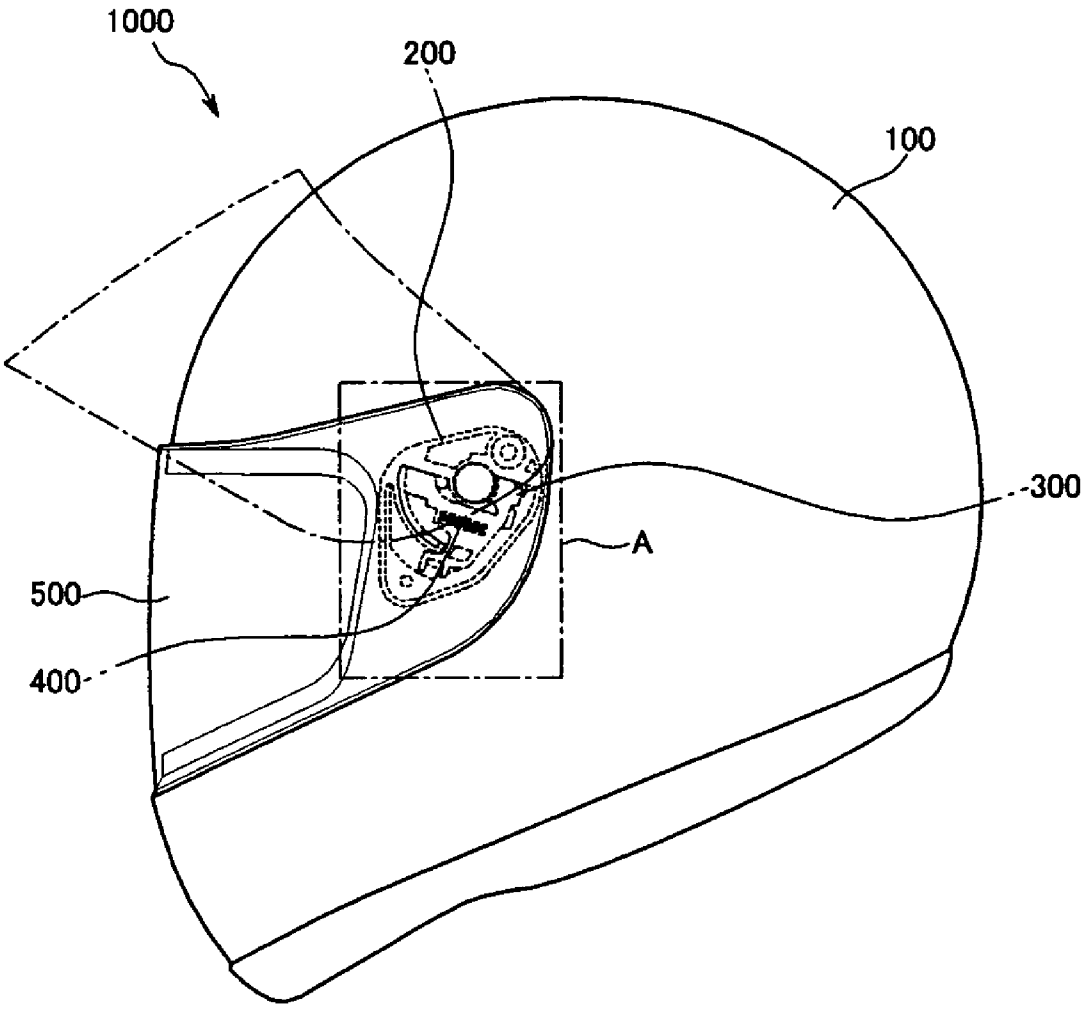


FIG. 2

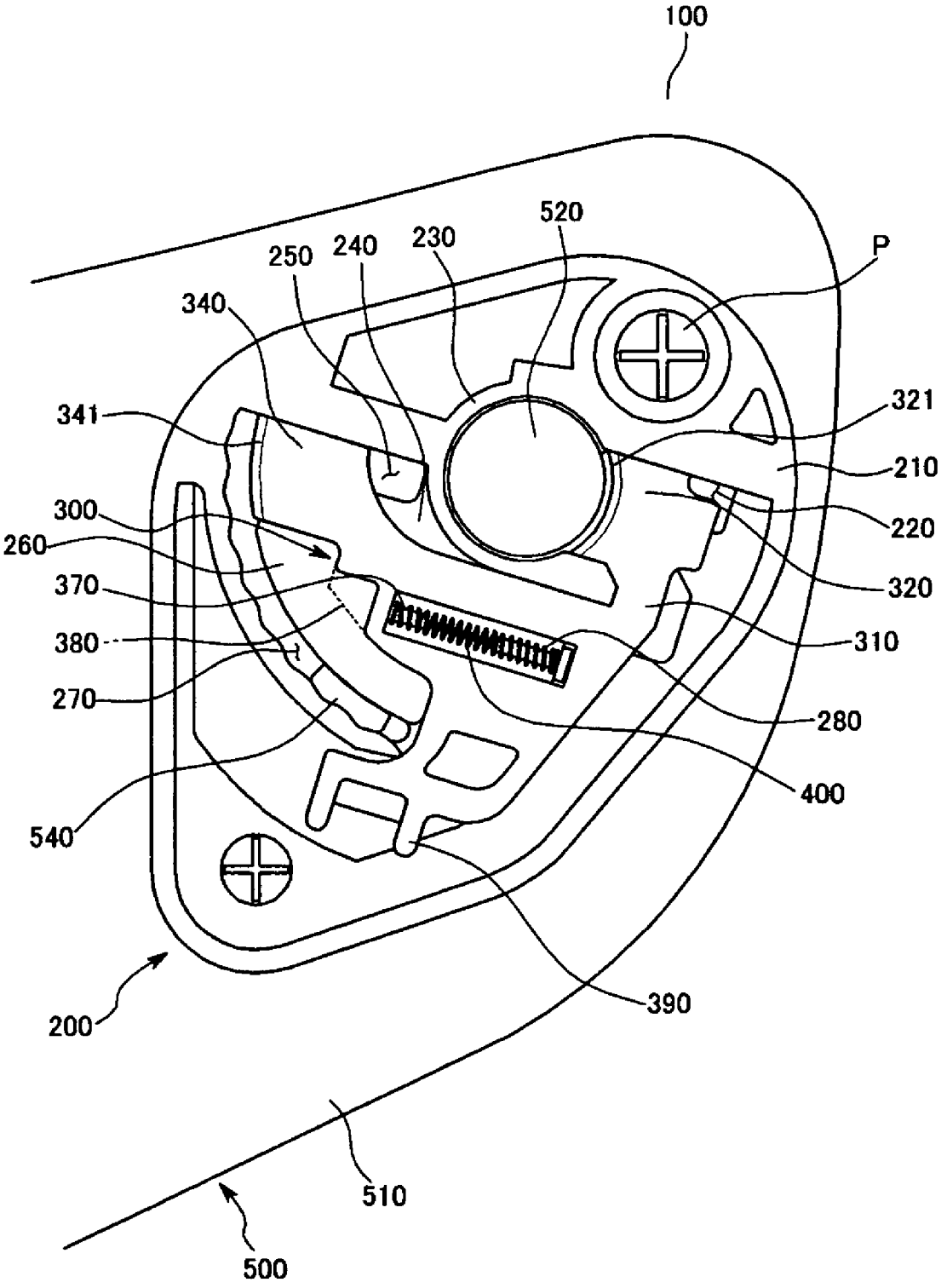

100
520
250
240
230
P
340
341
321
210
300
220
260
370
320
380
310
270
280
400
540
390
200
510
500

FIG. 3

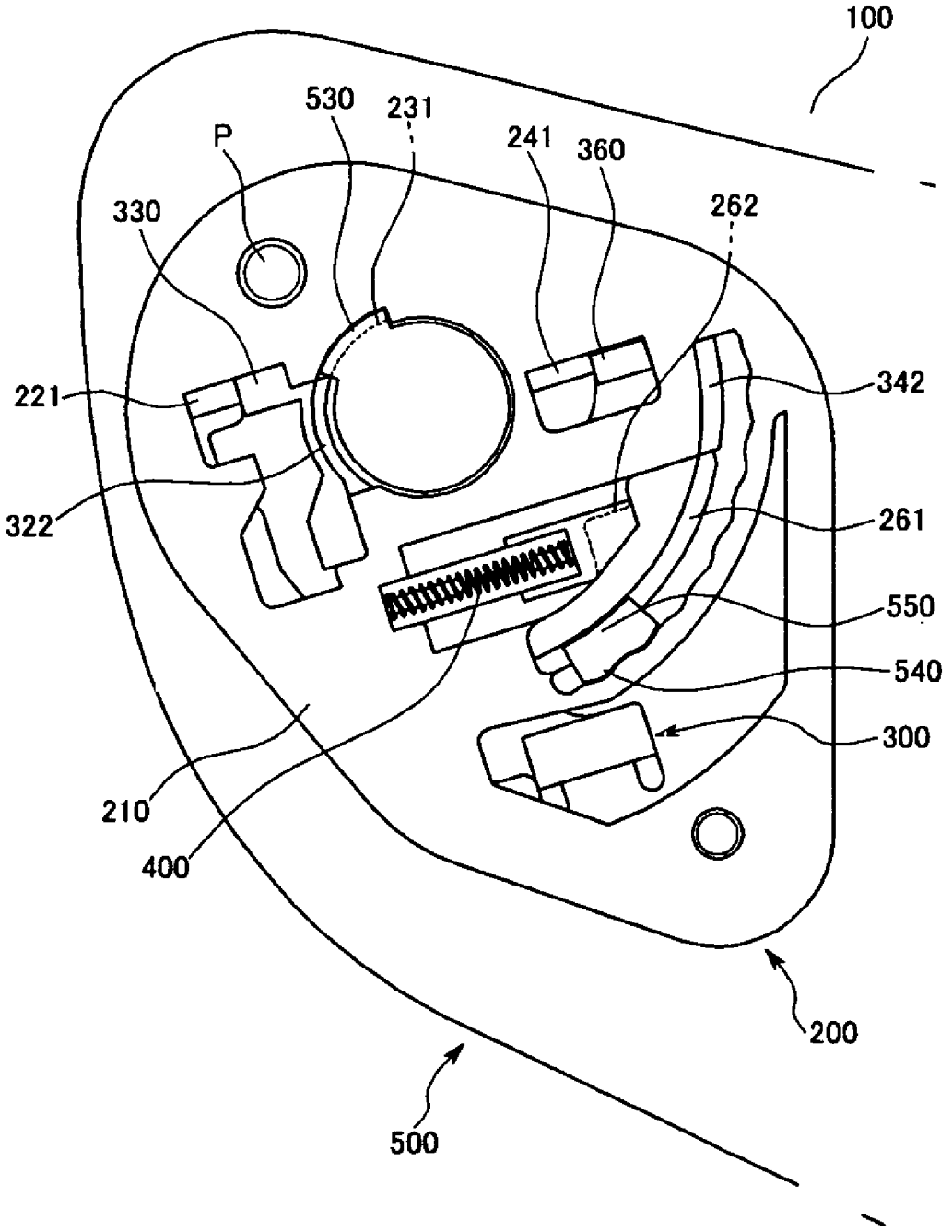

100
530
231
P
241
360
330
262
221
342
322
261
550
540
300
210
400
200
500

FIG. 4

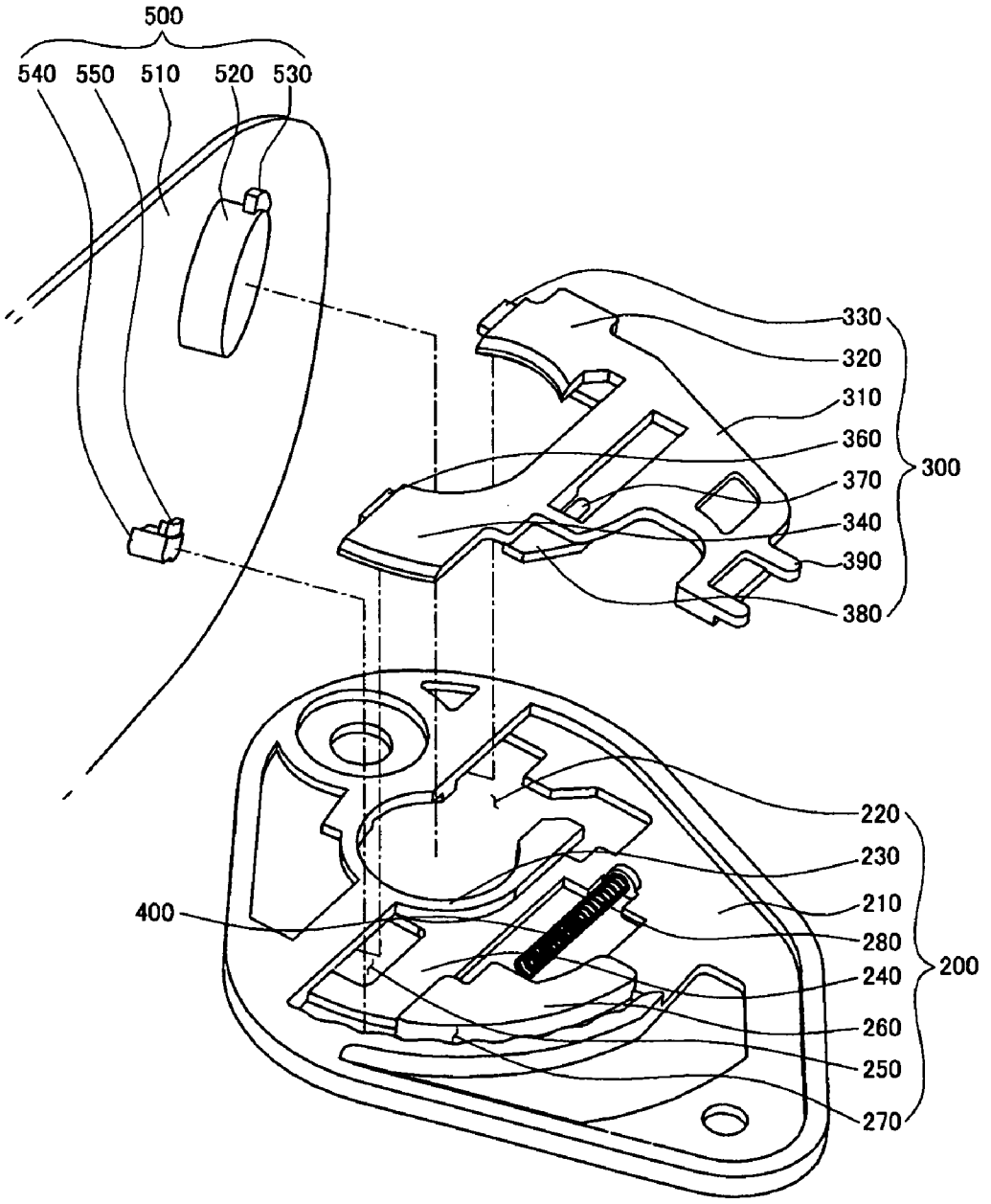

500
540
550
510
520
530
330
320
310
360
370
340
390
380
300
220
230
210
280
240
260
250
270
200
400

FIG. 5

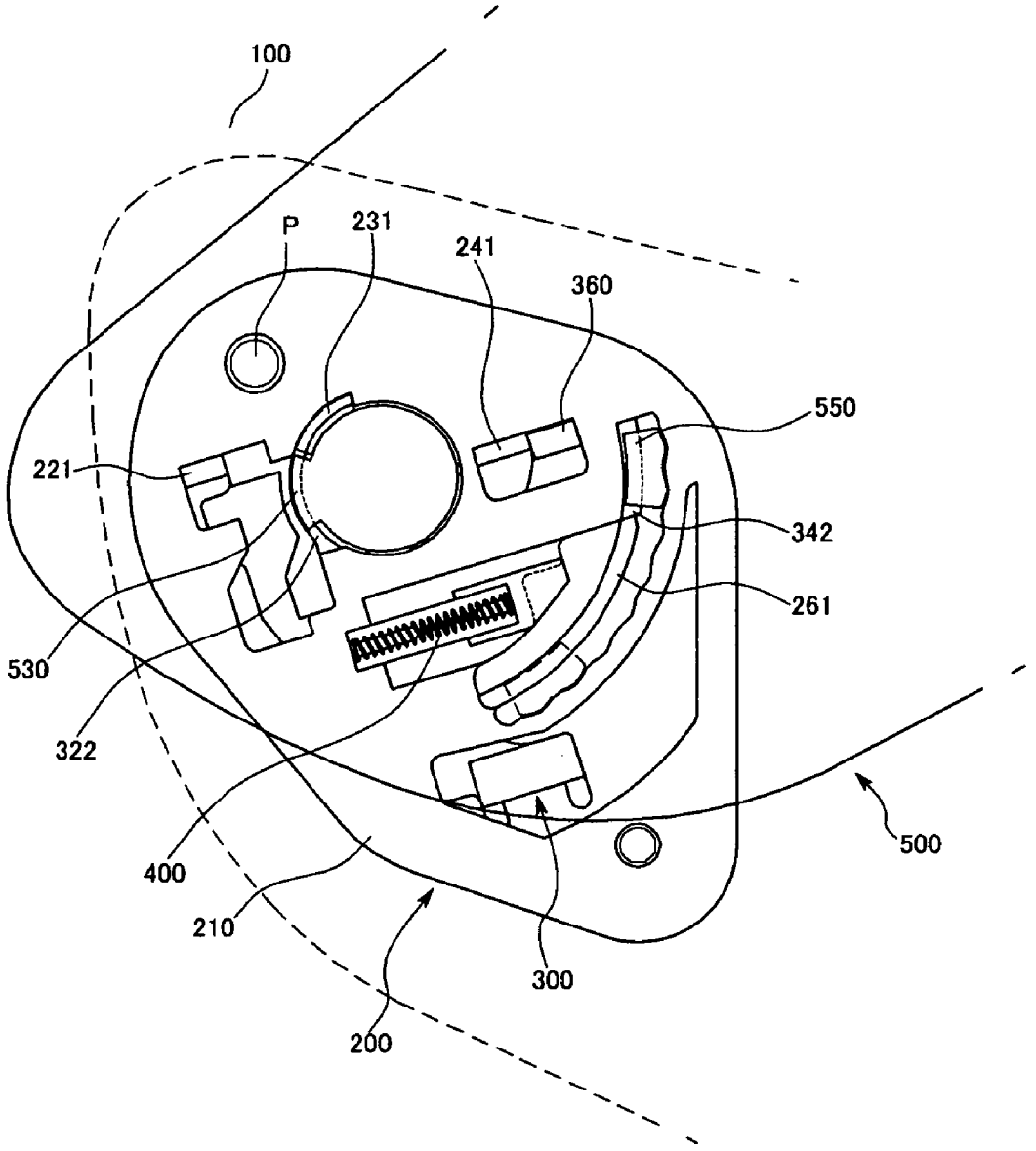


FIG. 6

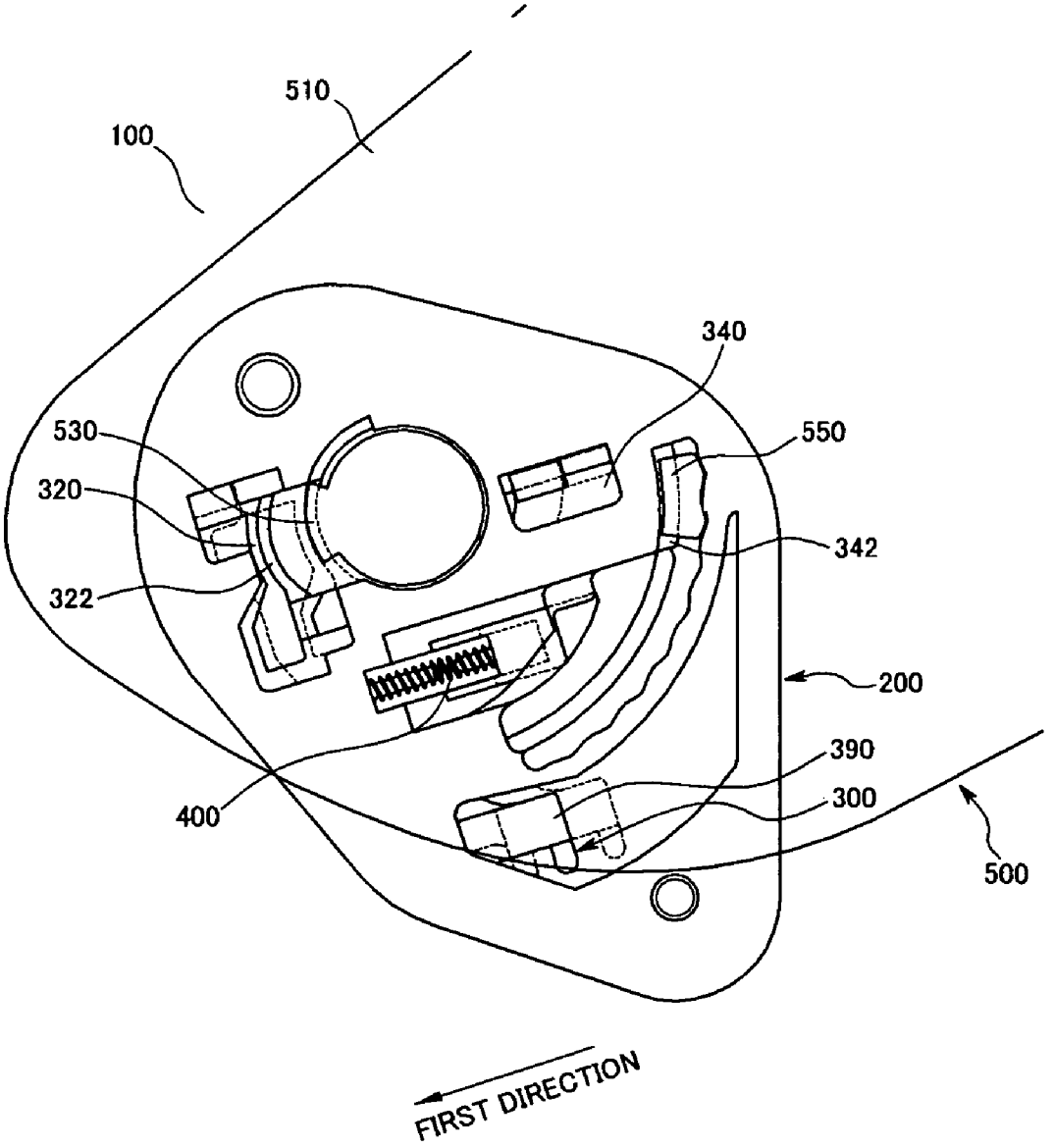
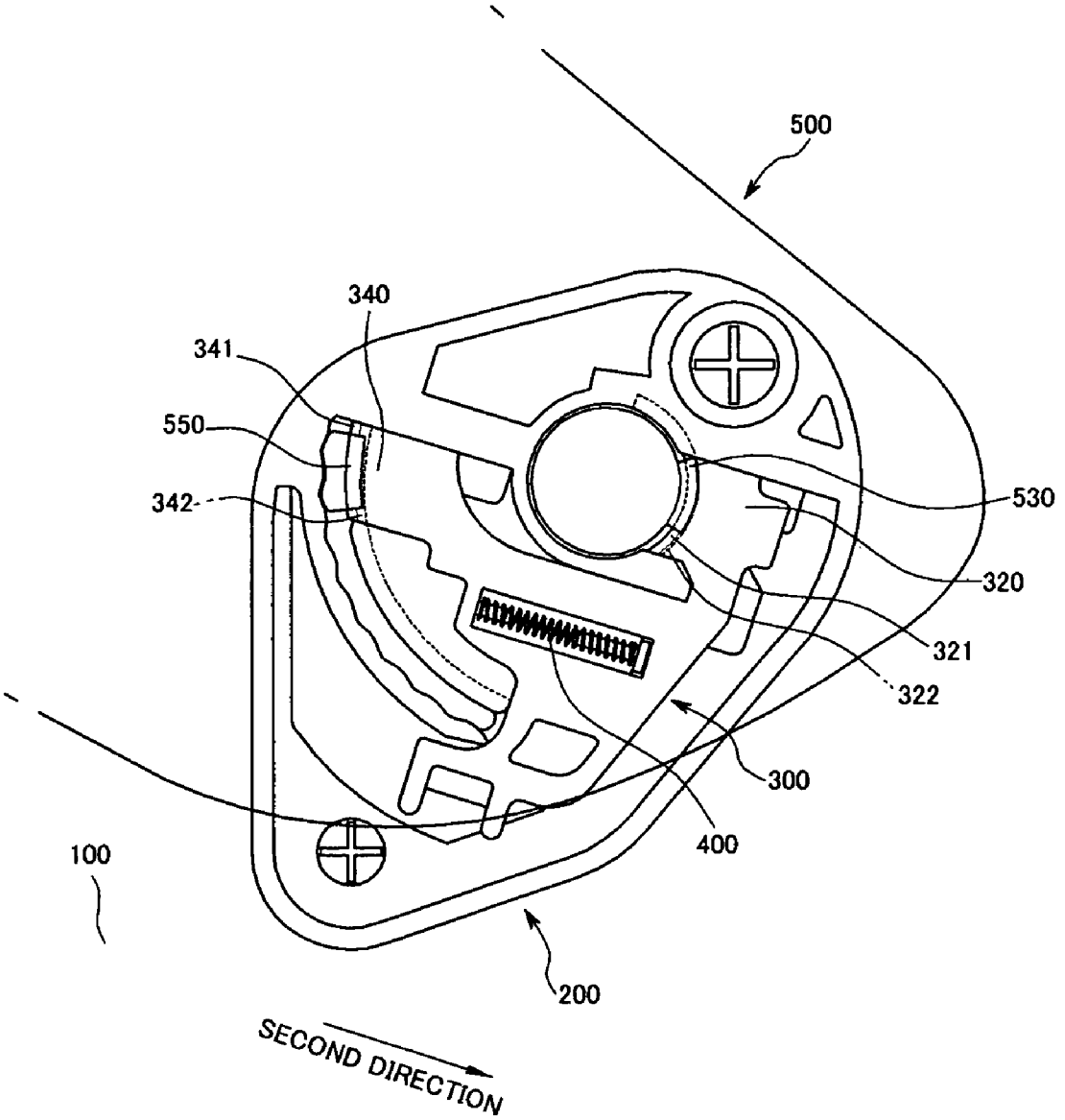

510
100
340
530
550
320
342
322
200
390
300
400
500
FIRST DIRECTION

FIG. 7


500
340
341
550
342
530
320
321
322
300
400
100
200
SECOND DIRECTION

HELMET

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of Korean Patent Application 10-2008-0006290, filed on Jan. 21, 2008, which is hereby incorporated by reference in its entirety.

FIELD OF THE INVENTION

The present disclosure relates to a helmet and in particular to a helmet including an attachable and detachable shield plate.

BACKGROUND OF THE INVENTION

When a user rides a mobile vehicle such as a motorcycle on which the user is exposed to the outside, wearing a helmet becomes more important for the user's safety.

A helmet generally includes a helmet main body and a shield plate capable of opening and closing with respect to the helmet main body. The shield plate is coupled with the helmet main body by means of a coupling member such as a screw or the like.

However, when the shield plate is replaced according to the user's demands or the status of consumption thereof, it has been inconvenient to separate the coupling member from the helmet and connect the coupling member with the helmet again after replacing the shield plate with a new one and.

In order to solve this conventional inconvenience as mentioned above, there has been developed a helmet which includes a coupling member between the helmet main body and the shield plate so as to make it possible to easily attach and detach the shield plate to and from the helmet main body. However, there still exists a problem in that the coupling member for combining the shield plate with the helmet main body in the above-stated helmet is rather complicatedly constructed so that cost for manufacturing the helmet is increased.

As one of the conventional technologies in this regard, an invention entitled "Structure for installing shielding plate in helmet" is disclosed in Korean Patent Application No. 10-1994-0009409.

This conventional technology discloses a structure capable of reinforcing a binding strength of a shielding plate by engaging at least two places of the shielding plate with one locking member.

However, in this conventional technology, a locking lever constituting a coupling member is coupled with an installing plate by means of a guide hook so that the locking lever can be separated from the installing plate.

Further, the coupling member of this conventional technology is complicatedly configured in that a supporting shaft of the locking lever is rotatably inserted and engaged into a shaft hole formed on the installing plate.

BRIEF SUMMARY OF THE INVENTION

The object of an embodiment of the present invention is to solve the above-stated problems by providing a helmet having a simply configured coupling member.

In order to solve the above-stated technical problems, there is provided a helmet including: a helmet main body; a first plate fixed onto an outer surface of the helmet main body; a shield plate attachably and detachably installed on the first plate; a second plate combined with the first plate and moving

to a locking position or an unlocking position with respect to the first plate; and a spring for pressurizing the second plate toward the locking position, wherein the first plate includes: a supporting sphere formed in a circular shape; a first sliding unit formed after a part of a circumferential wall of the supporting sphere is removed; a protruding partition wall extending from an outside of the supporting sphere and formed into a circular arc shape concentric with a circumferential wall of the supporting sphere; and a second sliding unit formed in one end portion of the protruding partition wall, the shield plate includes: a rotation shaft rotatably combined with the supporting sphere; a first rotating hook formed in the rotation shaft; a click protruding unit engaged with a shield rotating guide groove formed along an outer periphery of the protruding partition wall; and a second rotating hook formed in the click protruding unit, the second plate includes: a first locking unit engaged with the first sliding unit and a second locking unit engaged with the second sliding unit, and spaces where the first and second sliding units are formed extend toward the outside of the circumferential wall of the supporting sphere and form a slide guide groove, the second plate slides along the slide guide groove, and the first and second rotating hooks are engaged with or disengaged from the first locking unit and the second locking unit respectively in the first and the second sliding units, thereby moving between the locking position and the unlocking position.

The first plate includes: a first structural coupling groove formed on an upper rear surface of the first sliding unit; a second structural coupling groove formed on an upper rear surface of the second sliding unit; and a third structural coupling groove formed on an inner peripheral rear surface of the protruding partition wall, the second plate includes: a first structural coupling hook, a second structural coupling hook and a third structural coupling hook formed on places each corresponding to the first, second and third structural coupling grooves, and the first to third structural coupling hooks can be inserted into a rear surface of the first plate from a top surface thereof so as to be slid into the first to third structural coupling grooves respectively.

The first plate includes: a first guide groove formed on an inner peripheral rear surface of the supporting sphere; and a second guide groove formed on an outer peripheral rear surface of the protruding partition wall, a second plate includes: a first locking groove extended from the first guide groove and formed on a rear surface of an end portion of the first locking unit; and a second locking groove extended from the second guide groove and formed on a rear surface of an end portion of the second locking unit, and when the shield plate rotates, the first rotating hook of the shield plate can rotate along the first locking groove and the first guide groove and the second rotating hook of the shield plate can rotate along the second locking groove and the second guide groove.

A top surface of the end portion of the first locking unit and a top surface of the end portion of the second locking unit of the second plate can be slantly formed.

An inner wall of the outside of the shield rotating guide groove and an outer surface of the click protruding portion **540** inserted and guided into the shield rotating guide groove are formed in a continuous wave shape and engaged with each other so that the shield plate can be fixed step by step when the shield plate main body rotates.

The first plate further may include a first spring supporting unit for supporting one end portion of the spring, and the second plate further may include a second spring supporting unit for supporting the other end portion of the spring while facing the first spring supporting unit.

The second plate further may include a lever with which a slide movement of the second plate can be manipulated.

In accordance with one of the above-stated solutions of the present invention, the helmet includes the second plate coupled with the first plate by means of a plurality of coupling hooks and capable of sliding between the locking position and the unlocking position with respect to the first plate so that it is effective to simplify the structure thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosure may best be understood by reference to the following description taken in conjunction with the following figures:

FIG. **1** is a perspective view of a helmet in accordance with an embodiment of the present invention;

FIG. **2** is an enlarged view of a part A of FIG. **1**;

FIG. **3** is a rear view of FIG. **2**;

FIG. **4** is an exploded perspective view of a principal part of a helmet in accordance with an embodiment of the present invention;

FIG. **5** is a view showing that a shield plate is rotated upwardly with respect to the helmet main body of FIG. **3**;

FIG. **6** is a view showing that the second plate of FIG. **5** slides with respect to a first plate; and

FIG. **7** is a view illustrating a status before the shield plate of FIG. **3** is combined.

DETAILED DESCRIPTION OF THE INVENTION

Hereinafter, embodiments of the present invention will be described in detail with reference to the accompanying drawings so that the present invention may be readily implemented by those skilled in the art. However, it is to be noted that the present invention is not limited to the embodiments but can be realized in various other ways. In the drawings, parts irrelevant to the description are omitted for the simplicity of explanation, and like reference numerals denote like parts through the whole document.

Through the whole document, the term "comprises or includes" and/or "comprising or including" means that one or more other components and/or existence or addition of elements are not excluded in addition to the described components and/or elements.

Hereinafter, a helmet in accordance with an embodiment of the present invention will be explained with reference to the accompanying drawings.

FIG. **1** is a perspective view of a helmet in accordance with an embodiment of the present invention; FIG. **2** is an enlarged view of a part A of FIG. **1**; FIG. **3** is a rear view of FIG. **2**; and FIG. **4** is an exploded perspective view of a principal part of the helmet in accordance with the embodiment of the present invention.

As illustrated in FIG. **1**, a helmet **1000** in accordance with an embodiment of the present invention includes a helmet main body **100**, a first plate **200**, a second plate **300**, a spring **400** and a shield plate **500**.

The helmet main body **100** is worn to protect a user from a variety of head injuries when the user rides a mobile vehicle. A position facing the user's eyes is exposed to the outside so as to allow the user to see a front view. The first plate **200** is fixed on an outer surface of the helmet main body **100** and the shield plate **500** is rotatably installed on an outer surface of the first plate **200**.

As illustrated in FIGS. **2** to **4**, the first plate **200** includes a first plate main body **210**, a first sliding unit **220**, a supporting sphere **230**, a second sliding unit **240**, a slide guide groove **250**, a protruding partition wall **260**, a shield rotating guide groove **270** and a first spring supporting unit **280**.

The first plate main body **210** is positioned on an outer surface of the helmet main body **100** and fixed to the helmet main body **100** by means of a coupling screw P.

As illustrated in FIG. **2**, the first sliding unit **220** is formed as an open space where a part of the circumferential wall of the supporting sphere **230** is removed, and as illustrated in FIG. **3**, a first structural coupling groove **221** is formed on an upper rear surface of the first sliding unit **220**.

The supporting sphere **230** is extended from the first sliding unit **220** and formed into a circular shape. A first guide groove **231** is formed on an inner peripheral rear surface of the supporting sphere **230**.

As illustrated in FIG. **2**, the second sliding unit **240** is formed on an outside space of the supporting sphere **230**, and as illustrated in FIG. **3**, a second structural coupling groove **241** is formed on an upper rear surface of the second sliding unit **240**.

The spaces on which the first sliding unit **220** and the second sliding unit **240** are formed are continuously extended toward the outside of the circumferential wall of the supporting sphere **230** and form the slide guide groove **250** where it is possible for the following second plate **300** to make a slide movement.

The protruding partition wall **260** protrudes and extends from the second sliding unit **240** and is formed into a circular arc shape approximately concentric with the circumferential wall of the supporting sphere **230**. As illustrated in FIG. **3**, a second guide groove **261** is formed on an outer peripheral rear surface of the protruding partition wall **260**, and a third structural coupling groove **262** is formed on an inner peripheral rear surface of the protruding partition wall **260**.

The shield rotating guide groove **270** is formed along the outer periphery of the protruding partition wall **260**. The first plate main body **210** facing the outer periphery of the protruding partition wall **260** is formed into a continuous wave shape.

The first spring supporting unit **280** is disposed between the first sliding unit **220** and the protruding partition wall **260** and protrudes from the first plate main body **210** in a direction parallel to an extending direction of the slide guide groove **250**.

The second plate **300** is slidably installed on the first plate **200** along the slide guide groove **250**. Hereinafter, the second plate **300** will be explained in detail.

The second plate **300** includes a second plate main body **310**, a first locking unit **320**, a first structural coupling hook **330**, a second locking unit **340**, a second structural coupling hook **360**, a second spring supporting unit **370**, a third structural coupling hook **380** and a lever **390**.

The second plate main body **310** is positioned on an outer wall of the first plate main body **210** and faced with the first plate main body **210**. The second plate main body **310** slides between a locking position and an unlocking position along the slide guide groove **250** of the first plate main body **210**.

The first locking unit **320** is positioned on one side of the second plate main body **310** and its one end portion is formed into a circular arc shape extended from the circumferential wall of the supporting sphere **230**. A top surface **321** of the end portion of the first locking unit **320** extended from the circumferential wall of the supporting sphere **230** is slantly formed. A first locking groove **322** extended from the first guide groove **231** is formed on the rear surface of the end portion of the first locking unit **320**. The first locking unit **320** slides between the locking position and the unlocking position through the first sliding unit **220**.

The second locking unit **340** is positioned on the other side of the second plate main body **310** and its one end portion is formed into a protruding circular arc shape extended from the circular arc shape of the protruding partition wall **260**. A top surface **341** of the end portion of the second locking unit **340**

extended from the protruding partition wall **260** is slantly formed. A second locking groove **342** extended from the second guide groove **261** is formed on the rear surface of the end portion of the second locking unit **340**. The second locking unit **340** slides between the locking position and the unlocking position through the second sliding unit **240**.

The first locking unit **320** and the second locking unit **340** are formed as one body. Accordingly, if the second plate **300** slides along the slide guide groove **250**, the first locking unit **320** slides together with the second locking unit **340** between the locking position and the unlocking position.

The first to third structural coupling hooks **330**, **360** and **380** are structurally combined with the first to third structural coupling grooves **221**, **241** and **262** respectively so as to prevent the second plate **300** from being detached from the first plate **200**.

In particular, the first structural coupling hook **330** of the second plate **300** is inserted into the rear surface of the first plate **200** from the top surface thereof and structurally combined with the first structural coupling groove **221**. When the second plate **300** slides, the first structural coupling hook **330** slides along the first structural coupling groove **221**.

The second structural coupling hook **360** of the second plate **300** is inserted into the rear surface of the first plate **200** from the top surface thereof and structurally combined with the second structural coupling groove **241**. When the second plate **300** slides, the second structural coupling hook **360** slides along the second structural coupling groove **241**.

The third structural coupling hook **380** of the second plate **300** is inserted into the rear surface of the first plate **200** from the top surface thereof and structurally combined with the third structural coupling groove **262**. When the second plate **300** slides, the third structural coupling hook **380** slides along the third structural coupling groove **262**.

As stated above, at three places, the first to third structural coupling hooks **330**, **360** and **380** are coupled with the first to third structural coupling grooves **221**, **241** and **262** respectively so that the second plate **300** can be installed on the first plate **200** with more stability.

The lever **390** is positioned at a lower portion of the second plate main body **310**. By pressurizing the lever **390** with the user's finger or the like, it is possible to induce a slide movement of the second plate main body **310**. If one end portion of the lever **390** touches one side of the first plate main body **210**, it is possible to stop the slide movement of the second plate main body **310**.

The second spring supporting unit **370** protrudes from the second plate main body **310** in a direction substantially parallel to an extending direction of the slide guide groove **250**. The second spring supporting unit **370** faces the first spring supporting unit **280** spaced apart therefrom by a predetermined distance.

The second spring supporting unit **370** together with the first spring supporting unit **280** supports the spring **400**.

The first spring supporting unit **280** and the second spring supporting unit **370** are inserted into each of the end portions of the spring **400** so that the spring **400** pressurizes the second plate **300** toward the locking position.

The shield plate **500** includes a shield plate main body **510**, a rotation shaft **520**, a first rotating hook **530**, a click protruding portion **540** and a second rotating hook **550**. The shield plate **500** can be closed and opened with respect to an exposed portion of the helmet main body **100** facing the user's eyes. The shield plate main body **510** is made of a transparent resin and its both sides are positioned on the outer surface of the helmet main body **100**.

The rotation shaft **520** protrudes from a side portion of the shield plate main body **510** and is loosely inserted into the supporting sphere **230**. When the shield plate main body **510** is closed and opened with respect to the exposed portion of the helmet main body **100**, the shield plate main body **510** rotates centering on the rotation shaft **520**.

The first rotating hook **530** protrudes by bending and extending from one end portion of the rotation shaft **520**. The first rotating hook **530** can move between the first guide groove **231** and the first locking groove **322** when the shield plate main body **510** rotates.

The click protruding portion **540** protrudes form the shield plate main body **510** spaced apart from the rotation shaft **520** by a predetermined distance. The click protruding portion **540** is inserted into the shield rotating guide groove **270**, and the click protruding portion **540** rotates along the shield rotating guide groove **270** and guides a rotation of the shield plate main body **510** when the shield plate main body **510** rotates centering on the rotation shaft **520**.

The outer surface of the click protruding portion **540** rotating along the shield rotating guide groove **270** is formed in the same as the continuous wave shape of the first plate main body **210** constituting the shield rotating guide groove **270** and engaged with the first plate main body **210**. Since the wave shape of the shield rotating guide groove **270** and the protruding wave shape of the click protruding portion **540** are engaged with each other, the shield plate **500** can be fixed step by step when the shield plate main body **510** rotates.

The second rotating hook **550** protrudes by bending and extending from one end portion of the click protruding portion **540**. The second rotating hook **550** can move between the second guide groove **261** and the second locking groove **342** when the shield plate main body **510** rotates.

Hereinafter, a procedure of separating the shield plate **500** from the helmet main body **100** will be explained with reference to FIGS. **5** and **6**.

FIG. **5** is a view showing that a shield plate is rotated upwardly with respect to the helmet main body of FIG. **3**; and FIG. **6** is a view showing that a second plate of FIG. **5** slides with respect to a first plate.

Above all, as illustrated in FIG. **5**, the shield plate **500** is rotated upwardly with respect to the helmet main body **100**. If the shield plate **500** is rotated upwardly with respect to the helmet main body **100**, the first rotating hook **530** moves from the first guide groove **231** to the first locking groove **322**, and the second rotating hook **550** moves from the second guide groove **261** to the second locking groove **342**. Under this situation, the second plate **300** is positioned at the locking position.

Further, as illustrated in FIG. **6**, if the second plate **300** is induced to slide by using the lever **390** and moved to the unlocking position, the first locking unit **320** and the second locking unit **340** move in a first direction. Therefore, the first locking groove **322** which is locking the first rotating hook **530** of the shield plate **500** and the second locking groove **342** which is locking the second rotating hook **550** of the shield plate **500** move in the first direction, and the first rotating hook **530** and the second rotating hook **550** of the shield plate **500** are exposed toward a direction of the shield plate main body **510** so that it is possible to separate the shield plate **500** from the helmet main body **100**.

Hereinafter, a method of combining the shield plate **500** with the helmet main body **100** will be explained with reference to FIG. **7**.

FIG. **7** is a view illustrating a status before the shield plate of FIG. **3** is combined.

First of all, as illustrated in FIG. **7**, the first rotating hook **530** and the second rotating hook **550** of the shield plate **500** are disposed on an end portion of the first locking unit **320** and an end portion of the second locking unit **340** respectively.

Then, if the shield plate **500** is pressurized toward a direction of the first plate **200**, the first rotating hook **530** of the shield plate **500** pressurizes the first locking unit **320** in a second direction and the second rotating hook **550** pressur-

izes the second locking unit **340** in the second direction since the top surface **321** of the end portion of the first locking unit **320** and the top surface **341** of the end portion of the second locking unit **340** are slantly formed.

Subsequently, the second plate **300** slides in the second direction under the pressure of the first rotating hook **530** and the second rotating hook **550**. Due to such slide movement, the first rotating hook **530** is positioned at the first locking groove **322** and the second rotating hook **550** is positioned at the second locking groove **342**.

In this way, it is possible to combine the shield plate **500** with the helmet main body **100**.

As stated above, it is possible to induce the shield plate **500** to be attached to and detached from the helmet main body **100** by a simple slide movement of the second plate **300** with respect to the first plate **200** so that the structures of the first plate **200** and the second plate **300** are simple, and the second plate **300** and the first plate **200** are structurally stably combined with each other by the structural combination between the second plate **300** including the first to third structural coupling hooks **330**, **360** and **380** and the first plate **200** including the first to third structural coupling grooves **221**, **241** and **262**, whereby it is possible to provide the helmet **1000** having the attachable and detachable shield plate **500**.

The above description of the present invention is provided for the purpose of illustration, and it would be understood by those skilled in the art that various changes and modifications may be made without changing technical conception and essential features of the present invention. Thus, it is clear that the above-described embodiments are illustrative in all aspects and do not limit the present invention. For example, each component described to be of a single type can be implemented in a distributed manner. Likewise, components described to be distributed can be implemented in a combined manner.

The scope of the present invention is defined by the following claims rather than by the detailed description of the embodiment. It shall be understood that all modifications and embodiments conceived from the meaning and scope of the claims and their equivalents are included in the scope of the present invention.

What is claimed is:

1. A helmet comprising:

a helmet main body; a first plate fixed onto an outer surface of the helmet main body; a shield plate attachably and detachably installed on the first plate; a second plate combined with the first plate and moving to a locking position or an unlocking position with respect to the first plate; and a spring for pressurizing the second plate toward the locking position,

wherein the first plate includes:

a supporting sphere formed in a circular shape; a first sliding unit formed after a part of a circumferential wall of the supporting sphere is removed; a protruding partition wall extending from an outside of the supporting sphere and formed into a circular arc shape concentric with a circumferential wall of the supporting sphere; and a second sliding unit formed in one end portion of the protruding partition wall,

the shield plate includes:

a rotation shaft rotatably combined with the supporting sphere; a first rotating hook formed in the rotation shaft; a click protruding unit engaged with a shield rotating guide groove formed along an outer periphery of the protruding partition wall; and a second rotating hook formed in the click protruding unit,

the second plate includes:

a first locking unit engaged with the first sliding unit and a second locking unit engaged with the second sliding unit, and

spaces where the first and second sliding units are formed extend toward the outside of the circumferential wall of the supporting sphere and form a slide guide groove, the second plate slides linearly along the slide guide groove, and the first and second rotating hooks are engaged with or disengaged from the first locking unit and the second locking unit respectively in the first and the second sliding units, thereby moving between the locking position and the unlocking position,

wherein the first plate includes:

a first structural coupling groove formed on an upper rear surface of the first sliding unit; a second structural coupling groove formed on an upper rear surface of the second sliding unit; and a third structural coupling groove formed on an inner peripheral rear surface of the protruding partition wall,

the second plate includes:

a first structural coupling hook, a second structural coupling hook and a third structural coupling hook formed on places each corresponding to the first, second and third structural coupling grooves, and

the first to third structural coupling hooks are inserted into a rear surface of the first plate from a top surface thereof so as to be slid into the first to third structural coupling grooves respectively.

2. The helmet of claim **1**, wherein the first plate includes:

a first guide groove formed on an inner peripheral rear surface of the supporting sphere; and a second guide groove formed on an outer peripheral rear surface of the protruding partition wall,

a second plate includes:

a first locking groove extended from the first guide groove and formed on a rear surface of an end portion of the first locking unit; and a second locking groove extended from the second guide groove and formed on a rear surface of an end portion of the second locking unit, and

when the shield plate rotates, the first rotating hook of the shield plate rotates along the first locking groove and the first guide groove and the second rotating hook of the shield plate rotates along the second locking groove and the second guide groove.

3. The helmet of claim **1**, wherein a top surface of the end portion of the first locking unit and a top surface of the end portion of the second locking unit of the second plate are slantly formed.

4. The helmet of claim **1**, wherein an inner wall of the outside of the shield rotating guide groove and an outer surface of the click protruding portion inserted and guided into the shield rotating guide groove are formed in a continuous wave shape and engaged with each other so that the shield plate can be fixed step by step when the shield plate main body rotates.

5. The helmet of claim **1**, wherein the first plate further includes:

a first spring supporting unit for supporting one end portion of the spring, and

the second plate further includes:

a second spring supporting unit for supporting the other end portion of the spring while facing the first spring supporting unit.

6. The helmet of claim **1**, wherein the second plate further includes:

a lever with which a slide movement of the second plate can be manipulated.

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